

Remarks

Claims 1, 6-7, 11, 14-15, 20, 25-26, 29, 31-32, 36, 40-41, 44, 46-47, and 51-84 are pending in the present application. Claims 2-5, 8-10, 12-13, 16-19, 21-24, 27-28, 30, 33-35, 37-39, 42-43, 45, and 48-50 are hereby canceled without prejudice. Applicant reserves the right to file one or more continuing applications drawn to the subject matter of these canceled claims.

Claims 1, 6, 7, 11, 20, 25, 26, 29, 36, 40, 41, and 44 have been amended. Claims 1 and 36 were amended to incorporate subject matter from claims 5 and 39, respectively. Claim 20 was amended to incorporate subject matter from claim 24 and Table 2 (pages 24-25). Claims 6, 25, and 40 were amended to correct the dependence thereof in view of canceled claims and to correspond to changes made to their respective base claims. Claims 7, 26, and 41 were amended to correspond to changes made to their antecedent claims. Claims 11, 29, and 44 were amended to correct dependence thereof in view of canceled antecedent claims.

Claims 51-84 are new claims. Support for claims 51, 67, and 75 is found at Table 2, for example. Support for claims 52-57, 59-65, 68-73, and 79-84 is found at claims 5, 24, and 39. Support for claims 58, 66, 74, and 84 is found at FIGS. 5-6, for example. Support for claims 76-78 is found at claims 40-44. No new matter is added to the application by virtue of these amendments.

I. Response to Rejection of Claims under 35 U.S.C. § 102

A. Legal Standards under Section 102

Before discussing rejections based upon 35 U.S.C. § 102, it is believed proper to state that to sustain a rejection under § 102 the Patent and Trademark Office must abide by the following statement of the law.

Under 35 U.S.C. § 102, anticipation requires that each and every element of the claimed invention be disclosed in a prior art reference. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1554, 220 USPQ 303, 313 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). In addition, the prior art reference must be enabling, thus placing the allegedly disclosed matter in the possession of the public. *In re Brown*, 329 F.2d 1006, 1011, 141 USPQ 245, 249 (CCPA 1964).

Akzo N.V. v. U.S. Int'l Trade Comm'n, 1 U.S.P.Q.2d 1241, 1245 (Fed. Cir. 1986).

B. Response to Rejection of Claims 1-2, 5-6, 7, 9, 12-17, 19-21, 24-27, 30-33, 35-36, 39-42, 45-48, and 50 under 35 U.S.C. § 102(b) as Anticipated by U.S. Patent No. 6,001,252

Claims 1-2, 5-6, 7, 9, 12-17, 19-21, 24-27, 30-33, 35-36, 39-42, 45-48, and 50 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,001,252 (“Rice”).

Rice discloses a method for *in situ* anaerobic dehalogenation of a halogenated organic compound in a groundwater plume. The method involves injecting a deoxygenated aqueous solution into a groundwater-saturated matrix within or upgradient of a source of the organic compound. The deoxygenated aqueous solution contains an electron donor to facilitate reductive dehalogenation of the organic compound. Rice discloses that lactate, pyruvate, formate, propionate, acetate, other organic acids, sugars, saccharides, polysaccharides, and other long-chain organic compounds can be used as such an electron donor (column 4, lines 7-21). At column 3, line 58, through column 4, line 6, Rice discloses that the electron donor is added at 100-500 times the concentration of the halogenated organic compound to be degraded in the plume, but that the maximum degradation rate is achieved at an electron donor concentration of 200 mg/L, even if the concentration of the halogenated source would suggest establishing a higher concentration. Rice further discloses that the electron donor is added in an additional 2-5 fold excess above and beyond the 100-500 fold excess noted above so that the electron donor can be used as a carbon source by electron acceptors other than the target halogenated organic compound.

Rice fails to disclose use of an electron donor that is a mixture of (a) a member selected from the group consisting of C₂-C₄ carboxylic acids and salts thereof, C₂-C₄ hydroxy acids and salts thereof, and mixtures thereof, and (b) a member selected from the group consisting of esters of C₂-C₄ carboxylic acids, esters of C₂-C₄ hydroxy acids, and mixtures thereof. Therefore, Rice

fails to disclose each and every element of the claimed invention, and, thus, fails to anticipate claims 1 and 36 and their dependent claims.

Rice further fails to disclose use of an electron donor comprising 3% to 60% by weight of a member selected from the group consisting of C₂-C₄ carboxylic acid and salts thereof, C₂-C₄ hydroxy acids and salts thereof, and mixtures thereof, as claimed in claims 20 and 75. Therefore, Rice fails to anticipate claims 20 and 75 and their dependent claims.

Rice suggests at the paragraph bridging columns 3 and 4 that the maximum amount of electron donor to be added to a treatment zone would be $200 \text{ mg/L} \times 5 = 1 \text{ g/L} = 0.1\%$ by weight. The minimum amount of electron donor in claims 20, 51, 67, and 75 is 3% by weight, i.e., thirty times the maximum amount suggested by Rice.

For these reasons, it is respectfully submitted that Rice fails to anticipate any claims currently pending in the application. For this reason, withdrawal is respectfully requested of the rejection of claims under 35 U.S.C. § 102(b) as anticipated by Rice.

C. Response to Rejection of Claims 4, 23, and 38 under 35 U.S.C. § 102(b) as Anticipated by U.S. Patent No. 5,464,771

Claims 4, 23, and 38 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,464,771 ("Bryant").

Claims 4, 23, and 38 have been canceled without prejudice. Therefore, the rejection of these claims is moot.

II. Response to Rejection under 35 U.S.C. § 103

A. Legal Standards under 35 U.S.C. § 103

Before responding directly to the issues raised by the Examiner under Section 103, the legal foundation for sustaining such a rejection will be reviewed. Briefly, an applicant for a patent is entitled to the patent unless the application fails to meet the requirements established by law. 35 U.S.C. §§ 102, 103. It is the Patent Office's duty to issue a patent or establish that the

applicant is not entitled to a patent under the law. *In re Warner*, 154 USPQ 173, 177 (C.C.P.A. 1967), *cert. denied*, 389 U.S. 1057 (1968). Thus, the burden is on the Patent Office to establish a *prima facie* case of obviousness. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). If no *prima facie* case of obviousness is established, then a rejection under Section 103 cannot properly be sustained. *In re Oetiker*, 24 U.S.P.Q.2d 1443 (Fed. Cir. 1992). If the Patent Office establishes a *prima facie* case of obviousness, then the burden of production shifts to the applicant to provide appropriate rebuttal, although the burden of persuasion always remains with the Patent Office. *Id.* Such rebuttal may include arguments, amendments, and/or presentation of objective indicia of nonobviousness. However, such objective indicia are always relevant to a determination of nonobviousness whether or not a *prima facie* case of obviousness has been established. *Stratoflex Inc. v. Aeroquip Corp.*, 218 U.S.P.Q. 871, 879 (Fed. Cir. 1987). To establish a *prima facie* case of obviousness, the Examiner must show all of the limitations of the claimed invention in the prior art. *In re Ehrreich*, 200 U.S.P.Q. 504, 509-11 (C.C.P.A. 1979). The subject matter of the invention must be considered as a whole and through the eyes of a hypothetical person of ordinary skill, not expert skill, in the relevant art at the time the invention was made. *Connell v. Sears, Roebuck & Co.*, 220 U.S.P.Q. 193, 199 (Fed. Cir. 1983). References must also be considered as a whole, including subject matter that teaches away from the invention as well as subject matter that suggests the invention, and not for their isolated teachings. *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 227 U.S.P.Q. 657, 669 (Fed. Cir. 1985). References may be combined if there is a suggestion, motivation, or incentive in the prior art to make such a combination. *In re Dillon*, 16 U.S.P.Q.2d 1897, 1901 (Fed. Cir. 1990) (en banc); *In re Jones*, 21 U.S.P.Q.2d 1941, 1943-44 (Fed. Cir. 1992). It is not permissible to use hindsight to pick and choose among isolated teachings in the art after first having read Applicant's application to learn the pattern of the invention. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988). Finally, all the facts in evidence are evaluated, and patentability is determined on the totality of the record. *In re Corkill*, 226 USPQ 1005, 1008

(Fed. Cir. 1985). Factual determinations made by the PTO must be based on a preponderance of the evidence, and legal conclusions must be correct. *In re Caveny*, 226 USPQ 1, 3 (Fed. Cir. 1985).

Pursuant to established legal authority, patentability under 35 U.S.C. § 103 requires a four-step analysis, which involves determining (1) the scope and content of the prior art, (2) the differences between the prior art and the claimed inventions, (3) the level of skill in the art, and (4) the objective evidence of nonobviousness that may have been presented. *W.L. Gore & Assocs., Inc. v. Garlock, Inc.*, 220 U.S.P.Q. 303, 311, 314 (Fed. Cir. 1983). After all of these factors have been considered, the ultimate legal conclusion on the issue of obviousness must be reached. With the above background in mind the rejections under 35 U.S.C. § 103 will be discussed.

B. Response to Rejection of Claims 3, 18, 22, 34, 37, and 49 under 35 U.S.C. § 103(a) over U.S. Patent No. 6,001,252

Claims 3, 18, 22, 34, and 49 were rejected under 35 U.S.C. § 103(a) over Rice. All of these claims have been canceled, thus, their rejection is moot.

However, it should be noted that Rice fails to disclose or suggest using the bacteria set out in claims 18, 34, and 49. Therefore, the examiner failed to show all of the limitations of the claimed invention in the prior art, and, thus, failed to establish a *prima facie* case of obviousness with respect to claims 18, 34, and 49.

Rice also fails to suggest use of an electron donor comprising a mixture of (a) a member selected from the group consisting of C₂-C₄ carboxylic acids and salts thereof, C₂-C₄ hydroxy acids and salts thereof, and mixtures thereof, and (b) a member selected from the group consisting of esters of C₂-C₄ carboxylic acids, esters of C₂-C₄ hydroxy acids, and mixtures thereof, as claimed in independent claims 1 and 36. Therefore, a rejection of claims 1 and 36 under 35 U.S.C. § 103(a) over Rice is unsupportable. Rice also fails to suggest adding an electron donor at an amount in the range of 3% to 60% by weight, as claimed in claims 20, 51,

67, and 75. Thus, a rejection of claims 20, 51, 67, and 75 under 35 U.S.C. § 103(a) over Rice is also unsupportable.

C. Response to Rejection of Claims 8, 10, 11, 28, 29, 43, and 44 under 35 U.S.C. § 103(a) over U.S. Patent No. 6,001,252 in view of U.S. Patent No. 6,420,594

Claims 8, 10, 11, 28, 29, 43, and 44 were rejected under 35 U.S.C. § 103(a) as unpatentable over Rice in view of U.S. Patent No. 6,420,594 ("Farone").

Claims 8, 10, 28, and 43 have been canceled without prejudice. Therefore, the rejection of these claims is moot.

Farone discloses polylactate compositions as substrates that slowly release hydroxy acids over time. Farone discloses that these compounds can serve as time-release sources of lactic acid for biodegradation of chemical compounds in soils, aquifers, wastestreams, industrial processes, and other systems (column 1, lines 11-14). Farone further teaches that esters of lactic acid are convenient for delivering lactic acid because esters of lactic acid are hydrolyzed to produce free lactic acid or a lactate salt (column 2, lines 48-59).

Farone fails to disclose or suggest delivering a mixture of lactic acid and an ester of lactic acid, as claimed in claims 11, 29, and 44, or a mixture of (a) a member selected from the group consisting of C₂-C₄ carboxylic acids and salts thereof, C₂-C₄ hydroxy acids and salts thereof, and mixtures thereof, and (b) a member selected from the group consisting of esters of C₂-C₄ carboxylic acids, esters of C₂-C₄ hydroxy acids, and mixtures thereof, as claimed in independent claims 1 and 36. In fact, Farone teaches away from making such a mixture. At column 1, lines 9-10, Farone teaches that the invention is directed to slow release of hydroxy acids over time. At column 2, lines 5-20, Farone teaches that short chain organic acids (such as lactic acid), simple organic esters (such as esters of lactic acid), and other short chain or simple organic compounds

have the problem that essentially all of the chemical is released at once in the area and is free to flow away from the contaminated area. Thus, frequent addition of the chosen compound is needed to keep a sufficient concentration of the compound in the contaminated area over time. The constant injection of high volumes of solutions will increase the volume of the system or aquifer and thereby

potentially cause further spread of the contamination. Furthermore, unless special measures are taken to deoxygenate the water and solutions which are injected, the level of oxygen in the system or aquifer will rise, thus harming the anaerobic atmosphere which fosters the microbes performing the reduction.

Farone still further teaches at column 2, line 64, through column 3, line 4, that

[a]lthough simple esters of lactic acid, such as ethyl lactate, delay the release of free lactic acid into solution, the lactic acid is still released and converted to hydrogen at a very high rate. This rate may be higher than the rate at which bacteria performing reductive dechlorination can consume it, and thus either be wasted or used by other bacteria which compete with the reductive dechlorination.

Thus, notwithstanding the Examiner's unsupported assertion that "[i]t would have been obvious to have used ethyl lactate or a combination of sodium lactate and ethyl lactate in the Rice method given Farone's teachings," the disclosures of Rice and Farone in their entireties teach away from making a combination of lactic acid and an ester of lactic acid because (1) release of the electron donor will be too rapid, (2) the electron donor will freely flow away from the contaminated area, (3) the electron donor will have to be added frequently to keep the concentration at effective levels, (4) injection of the necessary high volumes of electron donor will cause contamination to spread, (5) the level of oxygen in the system will rise, thus harming anaerobic conditions, (6) the electron donor will be wasted, and (7) the electron donor will harm reductive dechlorination by providing nutrients to competitive microorganisms. Therefore, the combination of Rice and Farone teach a person of ordinary skill in the art to avoid making a mixture of lactic acid and an ester of lactic acid. Hence, a *prima facie* case of obviousness has not been established with respect to claims 11, 29, and 44.

Likewise, a *prima facie* case of obviousness with respect to claims 1 and 36 is not established by the combination of Rice and Farone, because Rice and Farone teach away from making a mixture of (a) a member selected from the group consisting of C₂-C₄ carboxylic acids and salts thereof, C₂-C₄ hydroxy acids and salts thereof, and mixtures thereof, and (b) a member selected from the group consisting of esters of C₂-C₄ carboxylic acids, esters of C₂-C₄ hydroxy acids, and mixtures thereof, for the reasons set forth in the previous paragraph.

Therefore, when Rice and Farone are considered in their entireties, as required by the applicable law, they not only fail to show the existence of all of the limitations of the claimed invention in the prior art, but also teach away from making the presently claimed invention. For these reasons, a *prima facie* case of obviousness has not been established. Accordingly, withdrawal of the rejection of claims 11, 29, and 44 under 35 U.S.C. § 103(a) over Rice and Farone is respectfully requested.

Moreover, the combination of Rice and Farone fails to establish a *prima facie* case of obviousness with respect to claims 20 and 75, because the combination of Rice and Farone fails to disclose or suggest using the claimed amounts of the indicated compounds.

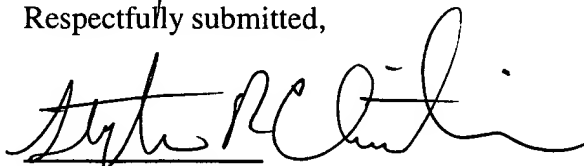
III. Conclusion

Should the Examiner deem it advisable to conduct a telephone interview for any reason, the undersigned attorney would be most agreeable to receiving a telephone call to expedite the prosecution of the application.

For the reasons given above, Applicant respectfully requests reconsideration and allowance of Claims 1, 6-7, 11, 14-15, 20, 25-26, 29, 31-32, 36, 40-41, 44, 46-47, and 51-84 and passage of this application to issue.

DATED this 7 day of JANUARY, 2004.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Stephen R. Christian", written over a horizontal line.

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